

AIR WAR COLLEGE

AIR UNIVERSITY

HEMORRHAGING HER...

A CAPABILITY GAP ANALYSIS ON WHY THE AIR FORCE  
CAN'T RETAIN FEMALE OPERATORS

by

Anne-Marie Contreras, Lt Col, USAF

A Research Report Submitted to the Faculty

In Partial Fulfillment of the Graduation Requirements

Advisor: Dr. Bert Frandsen

6 April 2017

## **DISCLAIMER**

The views expressed in this academic research paper are those of the author and do not reflect the official policy or position of the US government, the Department of Defense, or Air University. In accordance with Air Force Instruction 51-303, it is not copyrighted, but is the property of the United States government.



## **Biography**

Lieutenant Colonel Anne-Marie Contreras is currently a student at Air War College, Air University, Maxwell AFB, AL. Before arriving at Air War College, Lt Col Contreras was Chief, Vertical Lift Requirements Branch, Headquarters U.S. Air Force, in Washington DC. In this position, she was directly responsible for capability requirements development integrating warfighter needs with program and resource allocation for all vertical lift weapons systems in a portfolio worth over \$20.6 billion. Lt Col Contreras also served as the Deputy Air Force Lead for the Force Support and Logistics Functional Capabilities Boards supporting preparation of the Vice Chief of Staff of the Air Force for Joint Requirements Oversight Councils.

Lt Col Contreras grew up in Albuquerque, New Mexico and graduated from the U.S. Air Force Academy in 1997 where she received a Bachelor of Science Degree in Management. She graduated from Joint Specialized Undergraduate Pilot Training at Vance AFB in 1998 and received her wings from Air Force Helicopter Training at Fort Rucker, Alabama in 1999. She has been named a Professional Performer five times and has been part of two Professional Teams. She is a graduate of Flight Safety School, Advanced Instrument School, Operational Resource Management School, Squadron Officer School (in res), and Air Command and Staff College (in res). Her safety expertise was utilized on NASA's Columbia Shuttle Accident Investigation Board. Prior to her Pentagon assignment, Lt Col Contreras was the Commander of the 811th Operations Support Squadron at Joint Base Andrews, Maryland where her unit received special recognition as part of the Commander in Chief's Installation Excellence Award.

Lt Col Contreras is a Command Pilot with more than 2,300 hours of flight time and over 240 hours of combat time in the UH-1N, UH-1H, and UH-1HP. She has deployed in support of Operations ENDURING and IRAQI FREEDOM.

## Abstract

The AF's retention of female operators is at the forefront of its personnel issues. So far, the research on the retention of females in operations has focused on a multitude of survey analyses noting challenges in the difficulty of balancing a career and family, gender bias, and geographic instability. Although the AF has attempted to resolve some of these issues, it has not yet found success. This paper argues that the AF can improve the retention of female operators by addressing the problem through a capability gap investigation. Using a Joint Capabilities Integration and Development System (JCIDS) analysis, this paper will identify new. At the tactical level, increasing the availability of female flight suits and female urinary devices, adopting the Army's additional body armor sizes, and approving two-piece flight suit wear across all MAJCOMS can be implemented immediately. At the operational level, increasing female instructors at operator training bases, getting "two in the pool" as board members and nominees for selection boards, and maximizing simulator opportunities to maintain currency while pregnant or injured will take time, but must begin to be assessed now. Other recommendations such as eliminating the maximum number of females attending operator training, categorizing operator female and minority O-5s as high potential officers (HPOs), and improving bathroom facilities as a high interest item for new and upgrading major weapons systems (MWS) can be tackled in the near term. Finally, at the strategic level, increasing the number of female General Officers, reviewing anthropometric standards for MWS operator requirements, and updating the incentive pay program to counter pregnancy penalties must be addressed by senior leadership as soon as possible. It is time to go further and more quickly—allowing women to achieve as much as possible, for as long as possible, within the military system.

## Hemorrhaging Her...

In 1999, I arrived at Fort Rucker, Alabama to attend Undergraduate Pilot Training for Helicopters (UPT-H). I had just completed flight training at Vance AFB, Oklahoma in the mighty Cessna T-37 Tweet and was ready to kick some helicopter butt! Back then, the Army focused on immediate training in the aircraft instead of classroom time. On the first day, we were introduced to our Army contract instructors (who flew with the Army National Guard on weekends) and were taken straight to the flight line. As we stood on top of the helicopter, learning how to preflight the main rotor system, my instructor, Bubba Houser (yes, that was his real name), looked at me and said, “Now, since you’re a girl, I expect you to ask more questions since women don’t know about engines and such” followed by a spit of his dipping tobacco over the side of the helicopter! Luckily, my stick-buddy closed my jaw for me...welcome to UPT-H!

Women used to be a rarity in operations. The AF *allowed* women to enter pilot training in 1976, navigator training in 1977, and fighter pilot training in 1993 even though women were piloting military planes during World War II. Yet, I was the only female in my pilot training class in 1998 and the only female in my UPT-H class in 1999. Even now, in 2017, of the 237 students at Air War College, there are 29 women, only two of whom are operators—one pilot (me) and one Combat Systems Officer (CSO). With so many opportunities available in operations, where are the women?

Recent research on the retention of females in operations has focused on a multitude of survey analyses, noting challenges in the difficulty of balancing a career and family, gender bias, and geographic instability. Although the AF has attempted to resolve some of these issues, it has not yet found success. This paper argues that the AF can improve the retention of female operators by examining the problem as a capability gap. Using a Joint Capabilities Integration

and Development System (JCIDS) analysis, this paper will identify new challenges, and propose tangible changes the AF can implement at the tactical, operational, and strategic levels both immediately and over the long term.

In JCIDS, a DOTMLPF-P (Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities, and Policy) analysis is the first step in determining if a materiel or non-materiel approach is required to fill a capability gap. The AF uses the JCIDS gap-analysis process to buy new fighter aircraft, fill an urgent need request from the battlefield, or develop a new technology. By using a capability gap analysis to address the AF's female operator retention problem, this paper will identify new areas for the AF to implement in order to improve the retention of female operators.

For the purpose of this paper, operators include membership in the following utilization fields: 11XX (Pilots), 12XX (Combat Systems Officers (CSO)), 13XX (Space, Nuclear & Missile Operations, and Command and Control (C2)), and 18XX (Remotely Piloted Aircraft (RPA) Pilots). The terms 'operator' and 'rated' are used synonymously and 'Airman' is considered androgynous and refers to both men and women in the AF.

While writing this paper, some of the capability gap data began to overlap and have been combined for organization and readability. The topics have been merged: Organization with Leadership & Education, Materiel with Facilities, and Personnel with Policy. Doctrine and Training are addressed individually. Additionally, each topic includes its own definition(s), analysis, conclusions, and recommendations and is identified with stoplight colors at the beginning to rate its overall effect on the retention of female operators. Green is good and red is bad. An overall conclusion is also provided at the end.

In January 2013 the Department of Defense removed the “1994 Direct Ground Combat Definition and Assignment Rule” opening all military occupations and positions to women. The Secretary of Defense, Ash Carter, challenged the services to integrate women into the last remaining restricted occupational fields, with full implementation by January 1, 2016. This equated to the opening of 52 occupational specialties and approximately 213,600 positions.<sup>1</sup> The AF’s commitment to diversity is at an all-time high, but ironically, not a lot of women have been signing up for these new, now available, duties. If the AF can’t keep women in the service and specifically in operations, why does it think women will rush to sign up for these additional career fields?

Understanding why the AF can’t retain females is not a new research topic. There are a multitude of essays with different interpretations of the subject but with similar conclusions. Keller and Hall, 2017 RAND: “Retaining Female Officers in the Air Force” identified four main categories as factors to female retention: Family/Personal, Career, Work Environment, and Broader AF/Military.<sup>2</sup> Streeter, 2014, “The Air Force and Diversity, The Awkward Embrace,” identified the four top reasons for women leaving the AF as: starting a family, staying home with children, spending more time with family, and child care.<sup>3</sup> Penney and Krieger, 2016, “Female Officer Retention and the Millennial Imperative: Transforming Force Management into Talent Management,” find that “outdated force management practices unnecessarily restrict the officer talent pool, increase homogeneity in the ranks, prematurely exit officers from the service, and break-up Air Force families as system dynamics affect both genders.”<sup>4</sup> DiSilverio, 2003, “Winning the Retention Wars: the Air Force, Women Officers, and the Need for Transformation,” listed family-related factors, career-related factors, and geographic stability as the top retention factors.<sup>5</sup> The Service Women’s Action Network (SWAN) released its “1st

Annual Survey of Service Women and Women Veterans" in November 2016, identifying the top three challenges for the service-women community (over 1,000 service-women and women veterans polled) as: Gender Bias (48%), Family Policies and Practices (46%), and Sexual Harassment and Assault (42%).<sup>6</sup> Finally, King, 2016, "Retaining Women in the Military: Historical Perspectives on Policies and Current Work and Family Factors," indicated that post conscription, policies towards women are driven by war but are otherwise ignored, children are the biggest factor in continuing a career, and career satisfaction is most influenced by a positive family and leadership support.<sup>7</sup> This is just a sampling of the research looking to solve the disconnect between current female retention strategies and the desires of females within the AF. All of the research leads to three broad challenges to female retention: difficulties in balancing family and career, overcoming gender bias, and the desire for geographic stability. The DOTMLPF-P analysis will help identify issues beyond these three main challenges.

## DOTMLPF-P

Doctrine: How the military fights and if there is a better way to do so.

Analysis: Air Force doctrine involves androgynous Airmen integrating technological capabilities from multiple components to gain varying degrees of control in different domains to defeat our enemies. There is no doctrine for/against a specific gender performing a particular duty and in fact all AFSCs are now open to both men and women.

Conclusion: While it may have been in the past, doctrine is no longer a factor in the retention of women in operations.

Recommendation: N/A

## DOTMLPF-P

Organization: How the AF is organized to fight, to see if there is a better structure or capability that can be utilized.

**Leadership and Education:** How we prepare our Airmen to lead the fight and their professional development.

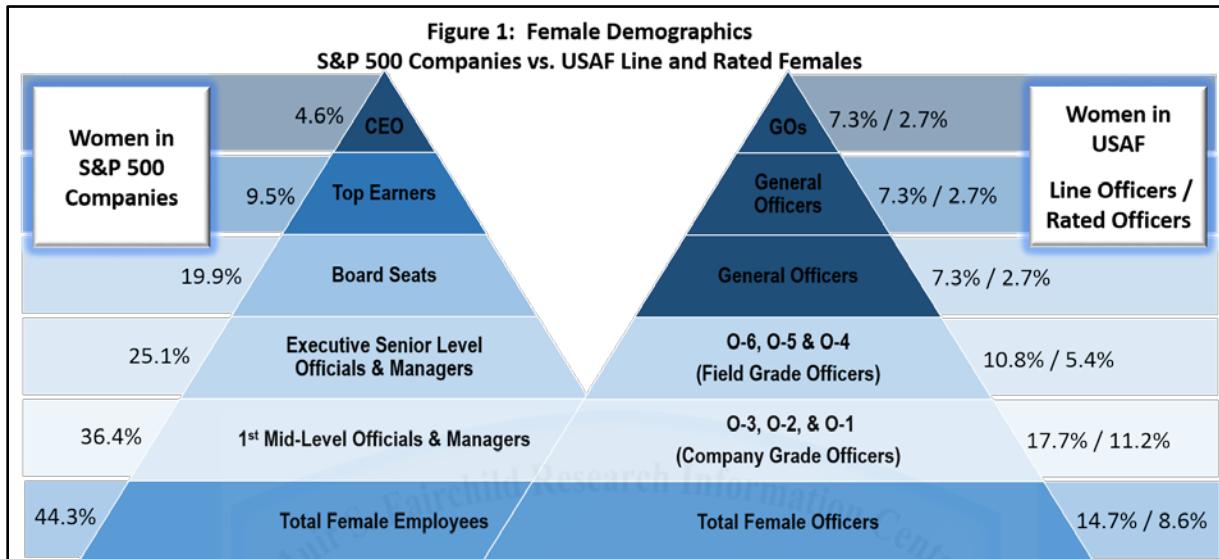
**Analysis:** On June 16, 2014, the Secretary of the Air Force released “Active Duty Applicant Pool Goals,” with a target of 30% female and 70% male demographics for the AF with the objective of recruiting a “larger, highly talented, diverse pool of applicants.”<sup>8</sup> “If the US military wants to optimize its teams’ collective intelligence and make better executive-level decisions, [it] must tap into the half of the population that is underutilized.”<sup>9</sup> The AF has to attract and retain more women.

According to the 2010 United States census population, 50.8% were female (157.0 million) while 49.2% were male (151.8 million).<sup>10</sup> The minimum educational requirement to become an AF officer is a Bachelor’s Degree. “Since the 1990s, the majority of all undergraduate and graduate degrees (58%) [in the U.S.] have gone to women” which means women are more likely to meet the eligibility requirements to become an officer.<sup>11</sup> This suggests that the gender difference between the general population and the AF is not based on admission prerequisites. The AF is unable to appreciably tap into half of the population due to other reasons, such as deficient recruiting, noncommittal career focus, or lack of interest in serving one’s country. As of December 31, 2016, the AF is comprised of 313,242 active duty personnel, with 80.6% men (252,473) and 19.4% women (60,769).<sup>12</sup> Only 56% of the women are line officers however.\* Of the 313,242 active duty personnel, 20,415 (6.5%) are operators comprised of 18,662 men (91.4%) and 1,753 women (8.6%).<sup>13</sup>

---

\* Line Officers exercise general command authority and are eligible for operational command positions. Officers who are not line officers generally serve in non-combat specialties such as chaplains, attorneys, and medical services.

One way to retain more women is to hire more women. Compared to the civilian sector, the AF is behind in its overall percentage of women, but exceeds the civilian norm in the percentage of women in upper management. Figure 1 compares the female demographics between S&P 500 Companies, AF Female Line Officers, and Rated AF Female Officers by



comparing the percentage of women at different levels of responsibility. While 44.3% of S&P 500 company positions are filled by women, the AF fills 14.7% of its line positions with women, and rated females account for only 8.6%.<sup>14</sup> Female line officers make up 7.3% of the General Officers in the AF, surpassing their female civilian CEO counterparts who only make up 4.6% in S&P 500 Companies, but fall short when compared to the Top Earner and Board Seat positions. Rated female General Officers account for only 2.7% of the General Officer corps, falling well short of all three civilian categories. When compared to their Executive/Senior Level Management counterparts at 25.1%, AF female Field Grade officers (O-4 to O-6) fall behind at only 10.8% of line and 5.4% of rated. As rank increases, retention of women decreases, which is further demonstrated in the rated community. It appears that the AF does not prioritize the retention of females until it is too late. According to the report “The Bottom Line: Corporate Performance and Women’s Representation on Boards” by *Catalyst*, “Fortune 500 companies

with the highest representation of women on the board of directors attained significantly higher financial performance, on average, than those with the lowest representation of women board directors.”<sup>15</sup> Diverse teams produce better results, experience greater innovation, and have higher revenue and profits, which leads to more opportunity for everyone, not just women. In other words, it’s hard to build a Super Bowl team if all your players are kickers.

According to a RAND study, women and minorities are promoted at lower rates than white men.<sup>16</sup> The AF becomes proportionately more male and more white as rank and time in service progress. A study published by the *Harvard Business Review*, “If There’s Only One Woman in Your Candidate Pool, There’s Statistically No Chance She’ll Be Hired,” highlighted a “status quo bias” of CEOs who generally prefer to hire more white men for leadership roles (CEOs are comprised of 95% white men and 85% of AF General Officers are white men).<sup>17</sup> The study reports that civilian board members subconsciously preferred to hire people who looked more like themselves for leadership roles. However, when the status quo changed, and two or more women were included in the pool of finalists, women became the favored candidate.<sup>18</sup> The same results were also seen with minorities. This “status quo bias” may affect promotion board rates and command hires within the AF. The key to gender balance in organizations is to overcome unconscious biases by getting at least two women in the pool of finalists.<sup>19</sup>

The AF is trying to address the “status quo bias” through its “2016 Diversity and Inclusion Initiatives Implementation Guidance (2016 DIIIG).”<sup>20</sup> This guidance mandates “Unconscious Bias Training” to key individuals involved in personnel selection, “establish[es] Diverse Slates for Key Military Developmental Positions” to ensure at least one diverse qualified candidate is included in hiring processes, and “ensures Diverse Command Screening Boards and Development Teams” by placing a diverse membership requirement.<sup>21</sup> Unfortunately, these

initiatives do not put more than one minority requirement in any of these actions, thus failing to “get two in the pool.”

Conclusion: Organization and Leadership & Education are factors in the retention of women in operations. The AF does not prioritize the retention of females early enough in their career and does not ensure more than one female and minority are included as board members and nominees for selection boards.

Recommendations:

1. In the AF, women become increasingly rare as rank increases, intensifying the scrutiny of the few near the top. Research shows that companies with the highest female representation on boards perform better than those with the lowest female representation. Lunardi, 2017, “General Officer Gender Diversity: How To Get From Here To There,” identifies one way to increase women’s representation at the AF leadership level is to replace the year Colonels are considered for General officer (year 24) with a window of years (24-26 years). Lunardi also suggests intentionally pairing diverse leadership teams across all Groups, Wings, Numbered Air Forces, and Major Commands, to increase diversity and thought.<sup>22</sup> [OPR HAF/A1, SAF]
2. Identify female and minority operators with the rank of O-5 and above as High Potential Officers (HPOs) to ensure equal opportunity in assignment selection and boards. There are currently 165 females ranked O-5 within the 11XX, 12XX, 13XX, and 18XX career fields.<sup>23</sup> This additional workload for the AF Personnel Center would far outweigh the loss of key female personnel. Remove personnel from the list only after retirement intentions are indicated. [OPR HAF/A1, AFPC]
3. “Status quo bias” may lead promotion board members to unconsciously promote only those who look like themselves. Ensure at least two females *and* two minorities are included as board

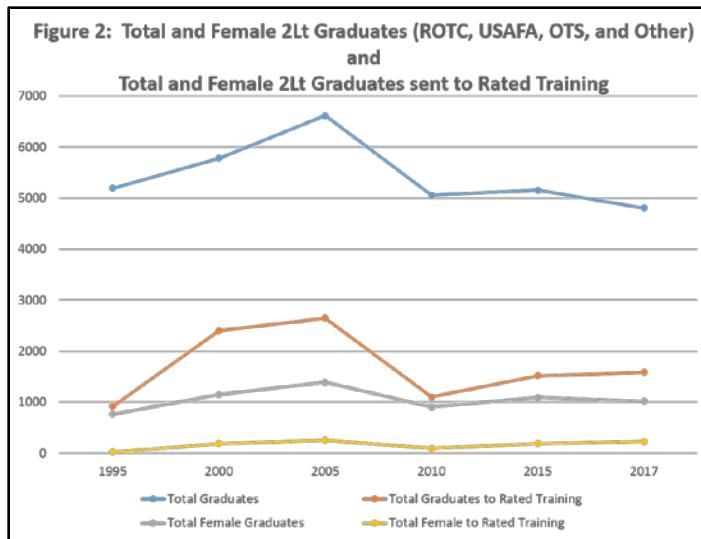
members and nominees in each promotion board, development team, and command selection board. [OPR HAF/A1]

## DO TMLPF-P

Training: How the military prepares forces to fight and determining if there are better ways to do so.

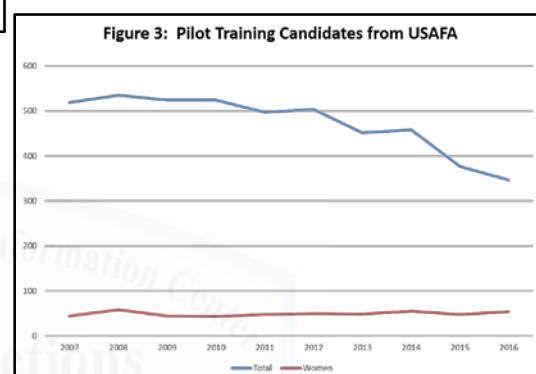
Analysis: The 2016 DIIIG looks to “encourage female and minority populations to serve in career fields that lack demographic diversity” by “improving and widening recruiting efforts within these career fields.”<sup>24</sup> The main career fields lacking representation of women according to the 2016 DIIIG are RPA pilots, pilots, CSOs, Special Tactics Officers, Air Battle Managers, and Space Operators—all from the 11XX, 12XX, 13XX, and 18XX specialty codes.<sup>25</sup>

In order to become an operator, an officer must be commissioned (usually from ROTC, USAFA, or OTS), medically qualified for the duty, be selected for training in that duty, and successfully complete that training. Of the commissioned officers entering the AF as a Second Lieutenant (O-1) over the past 20 years, on average AFROTC has produced 56.4%, USAFA 30.9%, OTS 12.1%, and 0.6% were commissioned from other sources.<sup>26</sup> Women have increased their percentage of graduating second lieutenants from 14.7% in 1995 (765 of 5,193) to 21.3% in 2017 (1,022 of 4,803).<sup>27</sup> The RAND study, “Diversity and the Success of Entering Classes at the U.S. Service Academies,” using data from 1992 to 2009, noted the percentage of women at USAFA was up to 21% by 2009 and graduation rates had increased to the point where they were on par with men.<sup>28</sup> Figure 2 illustrates women entering rated career fields have also shown an



training opportunities. This possible quota is demonstrated in Figure 3 which shows the number of females graduating from USAFA and sent to pilot training has averaged 49 for the last 16 years despite a steady decrease in total pilot training opportunities.

increase from 5.0% (46 of 920) in 1995 to 14.5% in 2017 (230 of 1,584).<sup>29</sup> This looks like a significant increase, however the number of women being sent to rated training has remained relatively constant over this period suggesting a quota for female rated



At the time of this writing, a 2017 RAND study, “Analysis of Barriers to Minority and Female Undergraduate Flying Training (UFT) Completion” was in AF staffing. This report may identify barriers to women at pilot training and provide recommendations for their resolution.

**Conclusion:** Training is a factor in the retention of women in operations. How will the service improve and widen recruiting efforts within these career fields when there has been no significant change in the number of women entering training?

#### Recommendations:

1. Increase or eliminate quotas for women entering operations training. The AF will need to train more women to eventually retain more women. The employment of operator technology takes intelligence and practice, not simply physical strength. [OPR HAF/A3]

2. Increase the number of female instructors at operator training bases to create mentorship opportunities. Try to get a minimum of two females at each assignment (“get two in the pool effect”). Work with development teams and assignments to identify instructor operator assignments as a special duty to negate the perception/reality that these assignments negatively affect career progression. [OPR HAF/A1, AETC/A1]

## **DOTMLPF-P**

**Materiel**: Examines all the equipment and systems necessary to fight effectively and determine if a new system may be required.

**Facilities**: Examines property that supports our forces.

**Analysis**: The equipment and facilities used in operations vary from simple to complex. What is the interface between (wo)man vs. machine? Of the 313,242 personnel in the USAF, 1,753 are female commissioned operators. This equates to just 0.5% of the AF. This 0.5% have made due with a host of less-than-ideal women vs. machine interfaces. For years, female operators have made their job work when it was originally designed without them in mind. The number one complaint from women is gear that doesn't take into account the differences between male and female bodies.

The concept of the flight suit originated prior to World War II to protect men from bugs, oil, and freezing temperatures in unpressurized cabins.<sup>30</sup> As the technology of aircraft increased, protective gear evolved to the current one-piece flight suit which is proportioned for men's bodies (see Figure 4). Due to different anthropometrics of men and women, female-specific sizes should have “narrower shoulders, smaller necks and waists, shorter upper torsos, and shorter legs.”<sup>31</sup> For most women, flight suits are worn ill-fitting in the waist and shoulders



**Figure 4:**  
**Air Force Flight Suit**

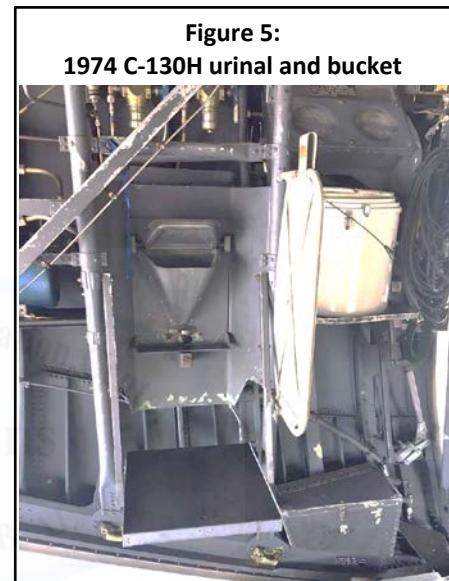
to fit breasts and hips. This also causes the crotch to hang mid-thigh, creating chaffing. Female flight suits do exist in the supply system, but are considered an enigma; they are difficult to locate, take a long time to arrive once ordered, and feedback varies on the value versus the effort in finding them.

On February 7, 2017, the AF released the updated AFI 36-2903, *Dress and Personal Appearance of Air Force Personnel*, which approved the Army Aircrew Combat Uniform (A2CU) two-piece flight suit with MAJCOM/A3 endorsement for wear in accordance with T.O 14-1-1. Assuming MAJCOMs endorse this option, the two-piece flight suit may solve the ill-fitting materiel factor for women.

Another materiel factor is the fit of body armor. With shorter sitting height, narrower shoulders, breasts, and smaller frames, current body armor is not suitable for all body types and may “compromise a woman’s ability to lift her arm appropriately.”<sup>32</sup> With the integration of women into all military combat positions, the Army has added eight additional sizes of body armor to accommodate female body types, allowing the service to “fit the smallest 2% of its women for the first time.”<sup>33</sup>

For female operators, the property which supports them is usually that associated with their major weapon system (MWS). The average age of AF aircraft is 25 years and Intercontinental Ballistic Missile (ICBM) crew facilities are nearly 30 years old—all under development before women were serving in these weapons systems and therefore did not include female-specific requirements.<sup>34</sup> Although most women have received nothing but respect and privacy from their male crew members, one top issue with the majority of MWSs for female operators is bathrooms.

Aircraft bathrooms vary from full lavatories, such as that on a commercial airliners, to a piddle pack or plastic bottle. On average however, the restrooms female operators must use afford no privacy and are not maintained during flight. Additionally, the one piece flight suit creates a ‘balancing act’ during bathroom use—the entire suit must be unzipped and gathered below the hips. Male counterparts can simply unzip while standing to urinate. Women on the B-52 must maneuver backwards to use a urinal or use a FUD (female urination device) without a privacy screen. Female AWACS operators complain that while the aircraft have lavatories, the male users do not generally hit their ‘target’ so the females have to ‘hover’ over the spatter to avoid the mess. For those on older C-130s, there is a bucket that is sometimes shielded with a curtain, sometimes not (see Figure 5). Women in helicopters use “tactical dehydration” as their method of choice—it is impossible to go to the bathroom in a non-permissive environment or they use a FUD in a permissive environment. Upgrades to some of these weapons systems have included boosts in avionics, weapons, and flight components but the bathrooms have not been a priority.



Another topic within facilities is aircraft ejections seats. AFI 48-123, *Medical Examinations and Standards*, establishes medical qualifications for operator duties. Anthropometric data for most operators is based on eight cardinal measurements: standing height, sitting height, buttock-knee length, sitting knee height, arm span, sitting eye height, acromial height (standing height from the floor to tip of shoulder), and functional reach.<sup>35</sup> These measurements have evolved over time based on the medical community’s response to the type of

flying being accomplished.<sup>36</sup> In the early 1900's, medical standards were designed to keep aviators safe. As faster, higher, and more maneuverable technology became available in the 1930's, the medical community began to look at how to mitigate stressors in flight, such as the effects of cold, altitude, limited oxygen, and g-loading. The last major update to medical standards was made in conjunction with the arrival of the space age in the 1960's. Since then, medical standards have been updated marginally and incrementally. Although the AF has done its best to remain gender neutral when it comes to medical standards, it has neglected gender integration. With the small percentage of women in operations, the AF has not felt the need to change outdated standards, ignoring anthropometric differences.

In 2015, the AF announced that pilots weighing less than 136 pounds would not be allowed to fly the F-35 due to unacceptable risk levels of neck injury during ejection at low-speed conditions.<sup>37</sup> Jones, 2014, "Certified Ejection Seat Weight Ranges and Their Effects on Personnel Selection" identified ejection seat weight limits, such as in the Navy's F/A-18, "prohibited over one third (38%) of women and (8%) of men from accessing the naval aviation strike pipeline between 2008 and 2013."<sup>38</sup> He notes that this restriction is due to "outdated anthropomorphic survey-based specification" and "needs to be updated to align with current operational risk management principles, actual ejection seat performance mishap data, and the naval aviation anthropomorphic population."<sup>39</sup> Similar assumptions could be made for AF aircraft fitted with ejection seats.

Conclusion: Materiel and Facilities are factors in the retention of women in operations. Although not critical major findings, materiel and facility deficiencies speak to the job satisfaction aspect for female operators. Ill-fitting uniforms and awkward bathrooms can make the performance of job duties cumbersome and challenging. Outdated anthropometric limits can

affect the qualifications of female operators in aviation. How much talent has the AF lost due to outdated anthropometric data? A service that shows respect for female rated officers will reap the benefits of individuals who perform better, are devoted to their duties, and continue their AF careers.

Recommendations:

1. Increase the availability of Female Flight Suits. Ensure Aircrew Flight Equipment personnel are aware of this uniform option when working with crews on their mission-specific gear issue and ensure female flight suit availability world-wide through supply channels, especially at initial issue locations where operator training takes place. [OPR HAF/A3, HAF/A4]
2. Adopt the Army's additional body armor sizes into the AF inventory to ensure the majority of female body types are accommodated. [OPR HAF/A3, HAF/A4]
3. Identify appropriate MWS communities to gain immediate endorsement and wear for the recently approved AC2U, two-piece flight suit. Special consideration for wear should be made for longer training sorties, operational missions, available bathroom facilities, and female use within each MWS. Ensure Aircrew Flight Equipment personnel are aware of this uniform option when working with crews on their mission-specific gear issue and ensure two-piece flight suit availability world-wide through supply channels. [OPR MAJCOM/A3, HAF/A3, HAF/A4]
4. Increase the availability of Female Urinary Devices. Identify appropriate FUDs for MWS use and ensure Aircrew Flight Equipment personnel are aware of different options (e.g. Shewee, Freshette, Aircrew Mission Extender Device (AMXD)) when working with crews on their mission-specific gear issue. Ensure FUD availability world-wide through supply channels. [OPR HAF/A3, HAF/A4]

5. Include bathrooms as a high interest item in all requirements for new and upgrading MWSs.

Identify any low cost modifications that can be performed on existing MWSs for increased quality of life for all operators while performing mission duties. [OPR HAF/A3, HAF/A5/8]

6. Echoing Jones' recommendations for the U.S. Navy, the AF should conduct a thorough review of anthropometric standards to ensure there is not an unfair bias against female sizes.<sup>40</sup>

Determine how many males and females did not historically qualify for different MWS pipelines based on outdated anthropometric limits but would have qualified based on performance.

Conduct an anthropometric study on the current operator population of the AF to establish a range more accurately reflecting AF aviation population needs. Create an AF anthropometric policy working group to update governing policies including clear guidance on limitations, waiver procedures, and risk assumptions. Ensure updated standards are placed into MWS upgrade and future requirements for cockpit/system interface design, bathrooms, ejection seats, etc. Use Jones' data as well as Zehner and Hudson's "Body Size Accommodation in USAF Aircraft" study for background data.<sup>41</sup> [OPR HQ AF/SG, HAF/A5/8, HAF/A3]

## **DOTMLPF-P**

Personnel: Examines the availability of qualified people for peace and war-time operations.

Policy: Examines any policy issues that may prevent effective implementation in the other seven DOTMLPF-P areas.

Analysis: The AF's retention of females and minorities is at the forefront of its personnel issues. Women in the military face a spectrum of attitudes from their male counterparts—from silent opposition, grudging tolerance, apathy, to active support. In the RAND study, "Minority and Gender Differences in Officer Career Progression," male officers offered three primary reasons why there was a difference in career development between men and women: 1-women are less capable (both physically and mentally), 2-previous prohibitions kept women out of the

occupations that experienced the most advancement, and 3-male superiors feared an unwarranted charge of sexual harassment and thus avoided interactions with female subordinates.<sup>42</sup>

The AF is expending time, money, and good intentions to build a more robust pipeline of upwardly mobile women and minorities, but hasn't addressed the existing toxic and systematic biases—the unconscious assumptions we all hold about men and women. The AF offers anti-harassment and discrimination training, but it doesn't offer bias awareness training. "When employees don't understand how bias works, they are less likely to make fair and accurate decisions."<sup>43</sup> Society expects men to be assertive, look out for themselves, and lobby for increased responsibility, so there's little pushback when they display these characteristics. Women are expected to be more sharing and collaborative, focused on the team and not themselves, lest they be viewed as self-absorbed and power hungry. When a woman advocates for herself, she is viewed as intimidating, aggressive, or bossy. According to RAND, gender stereotypes favor a "physical and aggressive leadership style" within the military that many men don't expect women are capable of exhibiting.<sup>44</sup> Men are assumed to be a success until proven otherwise while women are assumed a failure until proven otherwise; many men have yet to serve under a female commanding officer.<sup>45</sup>

The AF is doing it right in many areas when it comes to its policies and female operators. Women in the AF receive pay equal to their male counterparts. The FY17 National Defense Authorization Act (NDAA) allows for 12 weeks of leave for a primary care giver after the birth of a child, which includes 6 weeks of medical convalescent leave.<sup>46</sup> It also allows for 6 weeks of total leave for an adoption. Women are paid during their full pregnancy (even if they are unable to continue their operator duties) and receive 12 month deployment and fitness test deferments after childbirth. The AF has also increased paternity leave from 10 consecutive days to 14

nonconsecutive days. The FY17 NDAA will allow up to 21 days of leave for a secondary caregiver. Despite these benefits, there are still some areas where the AF can improve.

The AF must address policies and practices that communicate a mismatch between the value of men and women. In 1974, Congress passed the Aviation Career Incentive Act (ACIA) in an effort to solve pilot retention problems (conscription had ended and women would not enter military pilot training until 1976). The law created a pay entitlement, Aviation Career Incentive Pay (ACIP), for aviation service and is commonly referred to as ‘flight pay’ although the two are different. Over time, the fundamental differences between ACIP and flight pay were lost.

According to Walker, 2015, “Leveling the Playing Field: Rethinking the Career Aviator,” “...flight pay is an incentive pay for the active performance of flight duties and ACIP is an incentive pay for cumulative aviation service throughout a career.”<sup>47</sup> Air Force Instruction 36-2110, *Assignments*, adopted the gate month accumulation language for the ACIP entitlement into regulation governing assignments and eliminated the distinction between these two terms.<sup>48</sup> Based on the outdated nature of this regulation, a “pregnancy penalty” is created when female rated officers lose gate months while pregnant. Although each MWS is different, the average time out of the cockpit is approximately 12 months. As a woman falls behind her peers in accruing gate months due to pregnancy, she must accept more flying assignments to catch up with her peers, potentially losing the opportunity to go to a staff job or in-residence professional military education.

Conclusion: Personnel and Policies are factors in the retention of women in operations. The AF has not addressed existing male and female systematic biases. The AF ACIP policy is outdated and unintentionally discriminates against female operators by fostering a pregnancy penalty.

Recommendations:

1. There are some unintended consequences of the 12-week maternity leave on top of a 9-month pregnancy. Some women may be out of the cockpit for over 12-months. Update the AF's Career Intermission Program accessibility (allowing service members to move from active duty to the Individual Ready Reserves) and allow women to take an unpaid year off for pregnancy. Make the year off a non-punitive roll-back and adjust their year group upon completion. Continue to provide medical care with a 2-3 year payback requirement on the backend if the member accepts. Work with the Army and Navy's Career Intermission Pilot Program to identify best practices. [OPR HAF/A1, HAF/A3]
2. Review and revise MWS-specific qualification requirements to identify maneuvers that can be accomplished in the simulator to maintain the maximum currency/qualifications possible. More flexibility with simulators will decrease requalification training for pregnant or injured crew members once they are returned to mission-ready status. [OPR HAF/A3, MAJCOM/A3]
3. Address the gate month pregnancy bias by updating Aviation Career Incentive Pay regulations to increase career flexibility for female rated officers wanting to have a child. Walker recommends three proposals: a. modify Title 37 of the US Code allowing "pregnant officers to continue to earn gate months while occupying positions in which they would normally accrue gate months," b. allow operators to "forego the ACIP entitlement in order to increase assignment opportunities," and c. add specific language to the gate month waiver process in AFI 11-401, *Aviation Management*, to include pregnancy.<sup>49</sup>

The AF is falling short in translating top-level commitment into a truly inclusive work environment. Leadership says the right things, but many attitudes within the service have not changed. It is not enough to be gender neutral anymore, the services must become gender

integrated. The AF has been applying the same playbook of programs and policies for decades, but there is still a gaping hole between what leadership thinks they are doing and the barriers women experience day-to-day. Today's AF was designed by men, for men, with women's incorporation as an afterthought.

Women are an enormous asset in meeting the challenges the AF faces today and in the future. In order to retain more female operators, the AF must make immediate changes at the tactical, operational, and strategic levels. At the tactical level, increasing the availability of female flight suits and FUDs, adopting the Army's additional body armor sizes, and approving two-piece flight suit wear across all MAJCOMS can be implemented immediately. At the operational level, increasing female instructors at operator training bases, getting "two in the pool" as board members and nominees for selection boards, and maximizing simulator opportunities to maintain currency while pregnant or injured must begin to be assessed now. Other recommendations such as eliminating the maximum number of females attending operator training, categorizing operator female and minority O-5s as HPOs, and identifying bathrooms as a high interest item for new and upgrading MWSs can be tackled in the near term. Finally at the strategic level, increasing the number of female GOs, reviewing anthropometric standards for MWS operator requirements, and updating the ACIP program to counter pregnancy penalties must be addressed by senior leadership as soon as possible.

Recommendations not analyzed in this paper but worth considering for future research include: bases offering extended/overnight childcare to support families (especially dual military) who work night shift, have frequent TDYs, etc; create a travel voucher system to lessen the financial burden for those members who must fly in extended family to execute their family care plans; with the stay at home spouse no longer the norm, implement training for AF

leadership on up-to-date family model dynamics; adjust the assignment process to take civilian spouse's employment into consideration—it is difficult for civilian spouses to have successful careers with frequent military assignment moves; and increase the production and availability of pregnancy uniforms, which average a 6 to 12 month wait time.

Leaders with diversity of thought, experiences, and skills are required to solve the wicked problems of the future. Women will continue to have a significant role in our country's defense. Through a JCIDS gap analysis, this paper has identified tangible tactical, operational, and strategic level recommendations for the AF to improve the retention of female operators. The AF must continue its efforts to solve retention issues due to work-life balance, quality of life initiatives, and the removal of cultural and regulatory biases. Some can be accomplished quickly and others will take time, but it is in the best interest of the AF to do everything it can to retain its female operators. It is time to go further and more quickly—allowing women to achieve as much as possible, for as long as possible, within the military system.

## Notes

<sup>1</sup> Secretary of Defense to Secretaries of the Military Departments, Acting Under Secretary of Defense for Personnel and Readiness, Chiefs of the Military Services, and Commander U.S. Special Operations Command, letter, subject: Implementation Guidance for the Full Integration of Women in the Armed Forces, 3 December 2015.

<sup>2</sup> Keller and Hall, *Retaining Female Officers in the Air Force*, 11.

<sup>3</sup> Streeter, “The Air Force and Diversity: The Awkward Embrace,” 118.

<sup>4</sup> Penney and Krieger, “Female Officer Retention and the Millennial Imperative,” 1.

<sup>5</sup> DiSilverio, “Winning the Retention Wars,” 24.

<sup>6</sup> Service Women’s Action Network, “1st Annual Survey of Service Women and Women Veterans,” 2.

<sup>7</sup> King, “Retaining Women in the Military,” 140.

<sup>8</sup> The Secretary of the Air Force to AETC/CC and USAFA/CC, letter, subject: Applicant Pool Goals for Active Duty Officers, 16 June 2014.

<sup>9</sup> Haring, “Women in Battle, 32.

<sup>10</sup> Howden and Meyer. “2010 Census Briefs: Age and Sex Composition 2010.”

<sup>11</sup> Council of Economic Advisers Issues Brief, April 2015, “Gender Pay Gap: Recent Trends and Explanations.” [https://obamawhitehouse.archives.gov/sites/default/files/docs/equal\\_pay\\_issue\\_brief\\_final.pdf](https://obamawhitehouse.archives.gov/sites/default/files/docs/equal_pay_issue_brief_final.pdf), 2. AND Jessica Guynn, “Facebook’s Sheryl Sandberg on Tech’s Diversity Gap,” *USA Today*, 15 Aug 2014, <http://www.usatoday.com/story/tech/2014/08/12/facebook-sheryl-sandberg-diversity-gap/13787731/>.

<sup>12</sup> December 2016 Air Force Demographics. <http://www.afpc.af.mil/Air-Force-Demographics>.

<sup>13</sup> Data retrieved from <http://access.afpc.af.mil/> IDEAS (Interactive Demographic Analysis System). Data selection criteria included January 2017, DAFSCs 11XX, 12XX, 13XX, 18XX, Line Officers, Ranks O-1 to O-6, and gender.

<sup>14</sup> S&P 500 data in this section and chart reproduced from Catalyst. *Pyramid: Women in S&P 500 Companies* AND General Officer Demographic Data provided by Mr. Fred Essa, AFPC/DSYDT, Air Force Personnel Center Retrieval Section, 6 Dec 2016.

<sup>15</sup> Catalyst. “Companies With More Women Board Directors,” 1.

<sup>16</sup> Asch et al, *A New Look At Gender and Minority Differences*, 5.

<sup>17</sup> Johnson et al. “If There’s Only One Woman in Your Candidate Pool,” 2 AND AF data pulled from MilPDS and provided by Capt David Scanland, Chief, Analysis and Assessments, HAF/A1V Diversity & Inclusion, 6 Dec 2016.

<sup>18</sup> Johnson et al, “If There’s Only One Woman in Your Candidate Pool,” 3.

<sup>19</sup> Ibid, 5.

<sup>20</sup> Camorillo and Grosso, memorandum, subject: 2016 Diversity & Inclusion Initiatives Implementation Guidance, 19 January 2017.

<sup>21</sup> Ibid, Initiative 12, Initiative 1, and Initiative 2.

<sup>22</sup> Lt Col Tara Lunardi, “General Officer Gender Diversity: How To Get From Here To There?” 2017, page unknown. At the time this paper was written, Lt Col Lunardi’s paper was still in draft form.

<sup>23</sup> Data retrieved from <http://access.afpc.af.mil/> IDEAS (Interactive Demographic Analysis System). Data selection criteria included January 2017, DAFSCs 11XX, 12XX, 13XX, 18XX, Line Officers, Ranks O-5, and gender.

<sup>24</sup> Camorillo and Grosso, memorandum, subject: 2016 Diversity & Inclusion Initiatives Implementation Guidance, 19 January 2017, Initiative 7.

<sup>25</sup> Ibid.

<sup>26</sup> Data retrieved from <http://access.afpc.af.mil/> IDEAS (Interactive Demographic Analysis System). Data selection criteria included FY1995, FY2000, FY2005, FY2010, FY2015, and January 2017, line officers, gender, commissioning source, rank  $\leq$ 2Lt, and DAFSC 92TX.

<sup>27</sup> Ibid.

<sup>28</sup> Kirby et al, *Diversity and the Success of Entering Classes*, 2.

<sup>29</sup> Data retrieved from <http://access.afpc.af.mil/> IDEAS (Interactive Demographic Analysis System). Data selection criteria included FY1995, FY2000, FY2005, FY2010, FY2017, and January 2017, line officers, gender, commissioning source, rank  $\leq$ 2Lt, and DAFSC 92TX.

<sup>30</sup> Naomi Hochberg, “The Evolution of Flight Suits,” Intrepid Museum, 28 Oct 10, [http://www.intrepidmuseum.org/CuratorsCorner/October-2010-\(1\)/The-Evolution-of-Flight-Suits](http://www.intrepidmuseum.org/CuratorsCorner/October-2010-(1)/The-Evolution-of-Flight-Suits).

<sup>31</sup> Gross and Taylor, “Flight Suit Sizes for Women,” 3.

<sup>32</sup> Travis J. Tritten, “Form-Fitted Body Armor Rolling Out,” 2.

<sup>33</sup> Ibid.

<sup>34</sup> James and Welsh, *Fiscal Year 2015 Air Force Posture Statement*, 3.

<sup>35</sup> AFI 48-123, *Medical Examinations and Standards*, 5 November 2013, Aerospace Medicine and Col Bill Mueller, Waiver Guide, subject: Condition: Anthropometrics (Short Stature, Excessive Height, Weight, and Other Body Measurements), May 2014, 1.

<sup>36</sup> Historical perspective of Air Force Anthropometric data based on author's interview with Col Paul H. Nelson, USAF, MC, CFS, Air War College Surgeon General's Chair to Air University, on 19 December 2016.

<sup>37</sup> Seligman, "F-35 Ejection Seat Fix Delayed to 2018."

<sup>38</sup> Jones, "Certified Ejection Seat Weight Ranges," 6.

<sup>39</sup> Ibid.

<sup>40</sup> Recommendations derived from Jones, "Certified Ejection Seat Weight Ranges," 37-39.

<sup>41</sup> Zehner and Hudson. "Body Size Accommodation in USAF Aircraft" identify different sitting heights required for different aircraft within the AF inventory. This research is also outdated as it was compiled from 1997 to 2000.

<sup>42</sup> Hosek et al, *Minority and Gender Differences*, 76.

<sup>43</sup> Yee et al, "Women in the Workplace, 2016," 23.

<sup>44</sup> Hosek et al, *Minority and Gender Differences*, 78.

<sup>45</sup> Ibid, 79.

<sup>46</sup> McRae, "FY17 NDAA Impact on Airmen"

<sup>47</sup> Walker, "Leveling the Playing Field," 10-11.

<sup>48</sup> Ibid, 12.

<sup>49</sup> Recommendations extracted from Walker, "Leveling the Playing Field," 22-28.

## Bibliography

*Air Force Demographics, December 2016.* <http://www.afpc.af.mil/Air-Force-Demographics>.

Air Force Instruction 48-123, *Medical Examinations and Standards*, 5 November 2013, Aerospace Medicine and Col Bill Mueller, Waiver Guide, subject: Condition: Anthropometrics (Short Stature, Excessive Height, Weight, and Other Body Measurements), May 2014.

Anderson, Jenny. “The Ultimate Efficiency Hack: Have Kids.” *Quartz*, 11 October 2016. [http://qz.com/802254/the-ultimate-efficiency-hack-have-kids/?utm\\_source=atfb](http://qz.com/802254/the-ultimate-efficiency-hack-have-kids/?utm_source=atfb).

Anderson, Jenny. “This is What Work-Life Balance Looks Like at a Company with 100% Retention of Moms.” *Quartz*, 16 October 2016. <http://qz.com/806516/the-secret-to-patagonias-success-keeping-moms-and-onsite-child-care-and-paid-parental-leave/>.

Asch, B. J., Miller, T., & Malchiodi, A. *A New Look At Gender and Minority Differences In Officer Career Progression In The Military* (TR-1159-OSD). RAND Report. Santa Monica, CA: Rand National Defense Research Institute, 2012. [http://www.rand.org/pubs/technical\\_reports/TR1159.html](http://www.rand.org/pubs/technical_reports/TR1159.html).

Barton, Dominic. “It’s Time For Companies to Try a New Gender-Equality Playbook.” *The Wall Street Journal*, 27 September 2016. <http://www.wsj.com/articles/its-time-for-companies-to-try-a-new-gender-equality-playbook-1474963861>.

Bassett, Laura. “The U.N. Sent 3 Foreign Women to the U.S. To Assess Gender Equality. They Were Horrified.” *HuffingtonPost.com*, 15 December 2015. [http://www.huffingtonpost.com/entry/foreign-women-assess-us-gender-equality\\_us\\_566ef77de4b0e292150e92f0](http://www.huffingtonpost.com/entry/foreign-women-assess-us-gender-equality_us_566ef77de4b0e292150e92f0).

Bowman, Tom. “To Retain More Parents, The Military Offers A Better Work-Life Balance.” *NPR*, 12 October 2016. <http://www.npr.org/sections/parallels/2016/10/12/496911192/to-retain-more-women-the-military-offers-a-better-work-life-balance?sc=17&f=1001>

Carson, Brad, Senior Advisor to the Under Secretary of Defense for Personnel and Readiness, Performing the Duties of the Principle Deputy Under Secretary of Defense for Personnel Readiness to Secretaries of Military Departments, Chairman of the Joint Chiefs of Staff, Commander, United States Special Operations Command, memorandum, subject: Annual Assessment Regarding the Full Integration of Women in the Armed Forces, 18 March 2016.

Catalyst. “Companies with More Women Board Directors Experience Higher Financial Performance, According to Latest Catalyst Bottom Line Report,” accessed 14 November 2016, <http://www.catalyst.org/media/companies-more-women-board-directors-experience-higher-financial-performance-according-latest>.

Catalyst. *Pyramid: Women in S&P 500 Companies*. New York: Catalyst, 19 September 2016, <http://www.catalyst.org/knowledge/women-sp-500-companies>.

Camorillo, Gabriel O., Assistant Secretary of the Air Force and Lt Gen Gina M. Grosso, USAF, DCS, Manpower, Personnel and Services to Commanders, memorandum, subject: 2016 Diversity & Inclusion Initiatives Implementation Guidance, 19 January 2017.

Council of Economic Advisers Issues Brief, “Gender Pay Gap: Recent Trends and Explanations.” April 2015, [https://obamawhitehouse.archives.gov/sites/default/files/docs/equal\\_pay\\_issue\\_brief\\_final.pdf](https://obamawhitehouse.archives.gov/sites/default/files/docs/equal_pay_issue_brief_final.pdf).

*December 2016 Air Force Demographics*, <http://www.afpc.af.mil/Air-Force-Demographics>.

DiSilverio, Lt Col Laura A. H., “Winning the Retention Wars: The Air Force, Women Officers, And the Need for Transformation,” *Fairchild Paper*. Maxwell AFB, AL: Air University Press, August 2003.

Dharmapuri, Sahana. “Just Add Women and Stir?” Parameters, Strategic Studies Institute, Spring 2011, <https://strategicstudiesinstitute.army.mil/pubs/parameters/Articles/.../Dharmapuri.pdf>.

Duffy, Elana. “It’s Not Just Your Imagination: It Really Is Harder For Women to Get Promoted.” *Task and Purpose*. 5 October 2016. [http://taskandpurpose.com/not-just-imagination-really-harder-women-get-promoted/?utm\\_source=newsletter&utm\\_medium=email&utm\\_campaign=tp-today](http://taskandpurpose.com/not-just-imagination-really-harder-women-get-promoted/?utm_source=newsletter&utm_medium=email&utm_campaign=tp-today).

Gross, Mary E. and Stacie E. Taylor. “Flight Suit Sizes for Women,” Human Effectiveness Directorate Crew System Interface Division, United States Air Force Research Laboratory, Wright Patterson AFB, OH, January 2000.

Guynn, Jessica. “Facebook’s Sheryl Sandberg on Tech’s Diversity Gap,” *USA Today*, 15 August 2014, <http://www.usatoday.com/story/tech/2014/08/12/facebook-sheryl-sandberg-diversity-gap/13787731/>.

Haring, Ellen L. “Women in Battle: What Women Bring to the Fight,” *Parameters* 43, Summer 2013. [www.strategicstudiesinstitute.army.mil/pubs/parameters/issues/.../3\\_haring\\_article.pdf](http://www.strategicstudiesinstitute.army.mil/pubs/parameters/issues/.../3_haring_article.pdf).

Hochberg, Naomi. “The Evolution of Flight Suits,” Intrepid Museum, 28 October 2010, [http://www.intrepidmuseum.org/CuratorsCorner/October-2010-\(1\)/The-Evolution-of-Flight-Suits](http://www.intrepidmuseum.org/CuratorsCorner/October-2010-(1)/The-Evolution-of-Flight-Suits).

Holmquist, Jeff. “We’re Not Done Yet: Wolfenbarger ’80, Dunbar ’82 Posed to Help Open Up More Opportunities for Women in the Military,” *Checkpoints, AOG USAFA Alumni Magazine*, June 2016.

Hosek, Susan D., Peter Tiemeyer, M. Rebecca Kilburn, Debra A. Strong, Selika Ducksworth and Reginald Ray. *Minority and Gender Differences in Officer Career Progression*. RAND Report. Santa Monica, CA: Rand National Defense Research Institute, 2001. [http://www.rand.org/pubs/monograph\\_reports/MR1184.html](http://www.rand.org/pubs/monograph_reports/MR1184.html).

Howden, Lindsay M. and Julie A. Meyer. “2010 Census Briefs: Age and Sex Composition 2010,” United States Census Bureau, May 2011.

James, The Honorable Deborah Lee, Secretary of the Air Force and General Mark A. Welsh III, Chief of Staff, United States Air Force, *Fiscal Year 2015 Air Force Posture Statement*, [www.af.mil/Portals/1/documents/.../FY15\\_AF\\_PostureStatement\\_PRINTversion.pdf](http://www.af.mil/Portals/1/documents/.../FY15_AF_PostureStatement_PRINTversion.pdf).

James, The Honorable Deborah Lee, Secretary of the Air Force and General Mark A. Welsh III, Chief of Staff, United States Air Force, to AETC/CC and USAFA/CC, memorandum, subject: Applicant Pool Goals for Active Duty Officers, 16 June 2014.

Johnson, Kandia. “U.S. Army Extends 3-Year Sabbatical Program.” *Blackenterprise*, 11 July 2015. <http://www.blackenterprise.com/education/us-army-extends-3-year-sabbatical-program/>.

Johnson, Stefanie K., David R. Hekman, and Elsa T. Chan. “If There’s Only One Woman in Your Candidate Pool, There’s Statistically No Chance She’ll Be Hired,” Harvard Business Review, 26 April 2016, <https://hbr.org/2016/04/if-theres-only-one-woman-in-your-candidate-pool-theres-statistically-no-chance-shell-be-hired>.

Jones, Thomas C. “Certified Ejection Seat Weight Ranges and their Effects on Personnel Selection,” Human Systems Integration Capstone, Monterey, California: Naval Postgraduate School, September 2014.

Kane, Tim. *Bleeding Talent: How the U.S. Military Mismanages Great Leaders and Why It’s Time for a Revolution*. London, UK: Palgrave MacMillan, 2013.

Keller, Kirsten and Kimberly Hall. *Retaining Female Officers in the Air Force*. RAND Power Point Briefing. Santa Monica, CA: Rand National Defense Research Institute, 2017.

Keller, Kirsten and unknown. *Analysis of Barriers to Minority and Female Undergraduate Flying Training (UFT) Completion*. DRAFT in AF Staffing. Santa Monica, CA: Rand National Defense Research Institute, 2017.

Kirby, Sheila Nataraj, Harry J. Thie, Scott Naftel, and Marisa Adelson. *Diversity and the Success of Entering Classes at the U.S. Service Academies*. RAND Report. Santa Monica, CA: Rand National Defense Research Institute, 2010. [http://www.rand.org/pubs/research\\_briefs/RB9496/index1.html](http://www.rand.org/pubs/research_briefs/RB9496/index1.html).

King, Maj Erika Lee, BSW, MSW, “Retaining Women in the Military: Historical Perspectives

on Policies and Current Work and Family Factors,” Dissertation for Doctor of Philosophy at University of Texas at Austin, August 2016.

Krawcheck, Sallie. “It’s 2017, Why Are We Still Telling Women to Act Like Men at Work?” *Linked In*, 14 January 2007, <https://www.linkedin.com/pulse/its-2017-why-we-still-telling-women-act-like-men-work-krawcheck>.

Kurtz, Annalyn. “When the Pilot Is a Mom: Accommodating New Motherhood at 30,000 Feet.” *The New York Times*, 16 August 2016. [http://www.nytimes.com/2016/08/17/business/when-the-captain-is-mom-accommodating-new-motherhood-at-30000-feet.html?\\_r=0](http://www.nytimes.com/2016/08/17/business/when-the-captain-is-mom-accommodating-new-motherhood-at-30000-feet.html?_r=0).

Lim, Nelson, Louis T. Mariano, Amy G. Cox, David Schulker, and Lawrence M. Hanser. *Improving Demographic Diversity in the U.S. Air Force Officer Corps*. RAND Report. Santa Monica, CA: Rand National Defense Research Institute, 2014. [http://www.rand.org/pubs/research\\_reports/RR495.html](http://www.rand.org/pubs/research_reports/RR495.html).

Lublin, Joann S. “How Companies Are Different When More Women Are in Power.” *The Wall Street Journal*, 27 September 2016. <http://www.wsj.com/articles/how-companies-are-different-when-more-women-are-in-power-1474963802>.

Lunardi, Lt Col Tara. “General Officer Gender Diversity: How To Get From Here To There?” Maxwell AFB, AL: Air War College, 2017.

McCrea, SSgt Jannelle. “FY17 NDAA Impact on Airmen,” Air Education and Training Command, 27 December 2016, <http://www.aetc.af.mil/News/ArticleDisplay/tabid/5115/Article/1038676/fy-17-ndaa-impact-on-airmen.aspx>.

Penney, Maj Heather “Lucky” and Maj Miriam “Blitz” Krieger, “Female Officer Retention and the Millennial Imperative: Transforming Force Management into Talent Management,” (CSAF Special Project), 2016.

Reed, George E. *Tarnished: Toxic Leadership in the U.S. Military*. Lincoln, NE: Potomac Books, 2015.

Sandberg, Sheryl. “Women are Leaning In—But They Face Pushback.” *The Wall Street Journal*, 27 September 2016. <http://www.wsj.com/articles/sheryl-sandberg-women-are-leaning-inbut-they-face-pushback-1474963980>.

Seligman, Lara. “F-35 Ejection Seat Fix Delayed to 2018; Pilot Restrictions Continue,” *Defense News*, 8 January 2016, <http://www.defensenews.com/story/defense/2016/01/08/f-35-ejection-seat-fix-delayed-2018-pilot-restrictions-continue/78519892/>.

The Secretary of the Air Force to AETC/CC and USAFA/CC, letter, subject: Applicant Pool Goals for Active Duty Officers, 16 June 2014.

The Secretary of Defense to Secretaries of the Military Departments, Acting Under Secretary of

Defense for Personnel and Readiness, Chiefs of the Military Services, and Commander U.S. Special Operations Command, letter, subject: Implementation Guidance for the Full Integration of Women in the Armed Forces, 3 December 2015.

*Service Women's Action Network (SWAN)*. "1st Annual Survey of Service Women and Women Veterans" 14 November 2016. <http://www.servicewomen.org/uncategorized/swan-releases-1st-annual-survey-of-service-women-women-veterans/>.

Seymour, Lesley Jane. "Why We're in Trouble if Only Women Sign Up for Amazon's 30-Hour Work Week." *Linked In—Pulse*, 30 August 2016. <https://www.linkedin.com/pulse/why-were-trouble-only-women-sign-up-amazons-30-hour-work-seymour>.

Streeter, Colonel Suzanne M. "The Air Force and Diversity: The Awkward Embrace." *Air & Space Power Journal*, May-June 2014. <http://www.au.af.mil/au/afri/aspj/digital/pdf/articles/2014-May-Jun/F-Streeter.pdf>.

Tritten, Travis J. "Form-Fitted Body Armor Rolling Out as Combat Roles Expand for Women," *Stars and Stripes*, 4 March 2016. <http://www.military.com/daily-news/2016/03/04/form-fitted-body-armor-rolling-out-combat-roles-expand-women.html>.

United States Department of Labor, Wage and Hour Division. "FAQs: Break Time for Nursing Mothers." Accessed 29 August 2016. <https://www.dol.gov/whd/nursingmothers/>.

Walker, Major Edward Y. "Leveling the Playing Field: Rethinking the Career Aviator," Maxwell AFB, AL: Air Force Research Institute, April 2015.

Waller, Nikki. "How Men & Women See the Workplace Differently." *The Wall Street Journal*, 27 September 2016. <http://www.wsj.com/articles/how-men-women-see-the-workplace-differently-1474970085>.

Ward, Maeve C.H. "How Do You Measure a Year?" *Medium.com*, 17 October 2016. <https://medium.com/@maevechward/how-do-you-measure-a-year-eb455e3fe6b7#.z5v5dhj70>.

"Women Veterans: The Long Journey Home." *Disabled American Veterans*, September 2014. <https://www.dav.org/wp-content/uploads/women-veterans-study.pdf>.

Wolfe, Lt Col Thomas B. "Gender Integration in the USAF Fighter Community: 25 Years of Progress and Persistent Challenges." Maxwell AFB, AL: Air War College, 2017.

Yee, Lareina, Rachel Thomas, Alexis Krivkovich, Ashley Finch, Eric Kutcher, Marianne Cooper, PhD, Blair Epstein, and Ellen Konar, PhD. "Women in the Workplace: 2016." *LeanIn.Org and McKinsey & Company*. <http://www.mckinsey.com/business-functions/organization/our-insights/women-in-the-workplace-2016>.

Zarya, Valentina. "The Reason So Many Women Leave Engineering Has Nothing To Do With

Kids.” *Fortune.com*, 24 August 2016. <http://fortune.com/2016/08/24/women-leave-engineering/>.

Zehner, Gregory F. and Jeffrey A. Hudson. “Body Size Accommodation in USAF Aircraft.” Human Effectiveness Directorate Crew System Interface Division, Wright-Patterson AFB, OH, January 2002.

